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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/334,646	06/17/1999	SHUNPEI YAMAZAKI	0756-1984	5565

7590

07/26/2002

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MCLEAN, VA 22102

EXAMINER

HU, SHOUXIANG

ART UNIT

PAPER NUMBER

2811

DATE MAILED: 07/26/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/334,646

Applicant(s)

YAMAZAKI ET AL.

Examiner

Shouxiang Hu

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 25 March 2002.
- 2a) ☒ This action is FINAL. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) See Continuation Sheet is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3, 8, 11-14, 16-19, 32-34, 38-43, 52, 53, 58-60, 65, 71-73, 75-81 and 100-103 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☒ Certified copies of the priority documents have been received in Application No. 08/513,090.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 25.
- 4) ☐ Interview Summary (PTO-413) Paper No(s) _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

Continuation of Disposition of Claims: Claims pending in the application are 1-3,8,11-14,16-19,32-34,38-43,52,53,58-60,65,71-73,75-81 and 100-103.

DETAILED ACTION

1. This application is a divisional of U.S. Application No. 08/938,310, filed on September 26, 1997, now U.S. Patent 5,959,313, which itself is a divisional of U.S. Application No. 08/513,090, filed on August 9, 1995, now U.S. Patent 5,731,613.

Claim Cancellation

2. Claims 82-99 were canceled by Applicant in Paper No. 22. In addition, claims 6, 26-28, 48, 49, 63 and 74 were canceled in Amendment E (Paper No. 16) filed by Applicant on April 13, 2001.

Accordingly, claims 1-3, 8, 11-14, 16-19, 32-34, 38-43, 52, 53, 58-60, 65, 71-73, 75-81 and 100-103 are currently pending and active.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-3, 8, 11-14, 16-19, 32-34, 38-43, 52, 53, 58-60, 65, 71-73, 75-81 and 100-103 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zhang et al. ("Zhang"; 5,403,772) in view of Kuribayashi et al. ("Kuribayashi"; 5,233,447) and/or Matsueda (5,173,792).

Zhang discloses an active matrix type LC display device (Figs. 1-8A, particularly, Fig. 8A), comprising: a pixel matrix portion (104) having a plurality of pixels over a substrate (107) and a peripheral driver circuit portion (101 and 102), thin film transistors (TFTs) in the driver circuit portion each having a channel forming region in one of the separate semiconductor layers (11a and 11b) provided on an insulating surface, wherein the channel forming region is provided in a region which can be regarded as effectively monocrystalline silicon (see col. 6, lines 13-15); and, the channel forming region contains impurities (a type of point defects) of carbon, nitrogen and oxygen at a concentration less than 10^{18} cm^{-3} , which meets the limitation of each channel forming region "containing carbon and nitrogen at a concentration of $5 \times 10^{18} \text{ cm}^{-3}$ or less, respectively, and containing oxygen at a concentration of $5 \times 10^{19} \text{ cm}^{-3}$ or less" recited in the claimed invention.

It is noted that, since the channel forming region in Zhang is formed with a method which is substantially the same as the one used in the claimed invention, the method used in Zhang is regarded as being inherently capable of forming the channel forming region having no linear defects or surface defects. In addition, one of ordinary skill in the art would readily recognize that it is always desirable to form the channel forming region having no linear defects or surface defects for achieving good channel performance.

Although Zhang does not expressly disclose that the display device further comprises a buffer circuit in the driver circuit, one of ordinary skill in the art would readily recognize that such a buffer circuit is normally required for achieving desired driving

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output, as evidenced in Kuribayashi (see the buffer circuit (81) in Fig. 8; also see col. 8, lines 56-66). It is also evidenced in Kuribayashi (see Fig. 19) that an active matrix type display device commonly further comprises a memory, a decode and a display system for maintaining its basic display functionality.

Zhang does not expressly disclose that the peripheral driver circuit portion comprises at least two TFTs connected in parallel. Matsueda discloses an active matrix type LC display device (Figs. 1-12, particularly, Fig. 7), comprising: at least two TFTs (100A and 100B) provided on the surface of an insulating layer (110); a common gate wire (102); a common source wire (X_m); a common drain wire (101), wherein the channel forming regions of the parallel-connected transistors are provided in separate semiconductor layers respectively. Matsueda teaches that the reliability of a basic control element comprising two or more parallel-connected TFTs is better than that of a basic control element comprising a single TFT.

It would therefore have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the parallel-connected TFTs of Matsueda into the driver circuit in the display device of Zhang with the driver circuit including a buffer circuit, per the teaching of Kuribayashi, so that a display device with good reliability in the driver circuit would be obtained.

Regarding claims 11-14, 16-19 and 32-34, as mentioned above, an active matrix type display device commonly further comprises a memory, a decode and a display system for maintaining its basic display functionality.

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Regarding claims 38-43, 52, 53, 58-60 and 65, it is noted that it is well known in the art that the carrier mobility and crystallization quality are strongly correlated with the Raman spectrum width ratio and intensity ratio, as evidenced in the prior art such as in Fig. 3 of Yamazaki et al. (5,608,232), which shows that the Raman spectrum width ratio of WW_0 is 2.0 or less; and, that the Raman spectrum intensity ratio of I/I_0 is about 0.8 or more.

It would therefore have been obvious to one of ordinary skill in the art at the time the invention was made to make the device collectively taught by Zhang, Kuribayashi and Matsueda with the Raman spectrum width ratio of WW_0 being 2.0 or less and the Raman spectrum intensity ratio of I/I_0 being about 0.8 or more, so that improved display device performance with high-mobility TFTs would be achieved.

Response to Arguments

5. Applicant's arguments filed on March 25, 2002, have been fully considered but they are not persuasive.

In response to applicant's argument that there is no suggestion to combine the references as Matsueda only teaches to have parallel-connected TEFs in the pixel portion, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re*

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Jones, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, Kuribayashi teaches that an active matrix type display device commonly comprises a buffer circuit, a memory, a decode and a display system for maintaining its basic display functionality. And, Matsueda teaches that the reliability of a basic control element comprising two or more parallel-connected TFTs is better than that of a basic control element comprising a single TFT. With these teachings, one of ordinary skill in the art would readily recognize that the reliability of the buffer circuit and/or other peripheral circuits in the active matrix type LC display device of Zhang would also be improved if the basic transistor in the buffer circuit and/or other peripheral circuits is formed of two or more parallel-connected TFTs.

In response to applicant's argument that Applicant's claimed invention yields advantages of high voltage resistance and high speed performance by solving problems which Matsueda fails to recognize, the fact that applicant has recognized another advantage which would flow naturally from following the suggestion of the prior art cannot be the basis for patentability when the differences would otherwise be obvious. See *Ex parte Obiaya*, 227 USPQ 58, 60 (Bd. Pat. App. & Inter. 1985). In this case, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the parallel-connected TFTs of Matsueda into the driver circuit in the display device of Zhang for achieving better reliability in the driver circuit; and the advantages of high voltage resistance and high speed performance would flow naturally from the incorporation of the parallel-connected TFTs into the driver circuit.

Conclusion

6. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

7. Papers related to this application may be submitted to Technology center (TC) 2800 by facsimile transmission. Papers should be faxed to TC 2800 via the TC 2800 Fax center located in Crystal Plaza 4, room 4-C23. The faxing of such papers must conform with the notice published in the Official Gazette, 1096 OG 30 (November 15, 1989). The Group 2811 Fax Center number is (703) 308-7722 or 308-7724. The Group 2811 Fax Center is to be used only for papers related to Group 2811 applications.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ***Shouxiang Hu*** whose telephone number is **(703) 306-5729**. The examiner can normally be reached on Monday through Thursday from 7:30 AM to 6:00 PM.

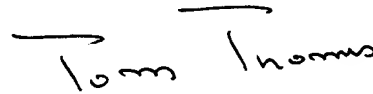
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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, **Tom Thomas**, can be reached on **(703) 308-2772**. The appropriate fax phone number for the organization where this application or proceeding is assigned is **(703) 308-7724**.

Any inquiry of a general nature or relating to the status of this application should be directed to the **Technology Center Receptionists** whose telephone number is **(703) 308-0956**.

SH

July 19, 2002



TOM THOMAS
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800